

**APPLICATION FOR A  
CAPITAL OUTLAY GRANT**

FOR AN

**URBAN WATER CONSERVATION PROJECT**

FOR

**MALAGA COUNTY WATER DISTRICT**

3580 S. Frank Street  
Fresno, CA 93725

SUBMITTED TO THE:

DEPARTMENT OF WATER RESOURCES

UNDER THE

SAFE DRINKING WATER, CLEAN WATER, WATERSHED PROTECTION  
AND FLOOD PROTECTION ACT (PROPOSITION 13)

February 27, 2002

Prepared By:



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<b>PART ONE</b>
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**A. Project Information**

- |   |  |             |  |                 |  |           |                |     |                |        |                   |
|---|--|-------------|--|-----------------|--|-----------|----------------|-----|----------------|--------|-------------------|
| 1. Applying for (select one):                                     | <input checked="" type="checkbox"/> (a) Prop 13 Urban Water Conservation Capital Outlay Grant<br><input type="checkbox"/> (b) Prop 13 Agricultural Water Conservation Capital Outlay Feasibility Study Grant<br><input type="checkbox"/> (c) DWR Water Use Efficiency Project  |             |  |                 |  |           |                |     |                |        |                   |
| 2. Principal applicant (Organization or affiliation):             | <div style="border-bottom: 1px solid black; padding-bottom: 5px;">Malaga County Water District</div>   |             |  |                 |  |           |                |     |                |        |                   |
| 3. Project Title:   | <div style="border-bottom: 1px solid black; padding-bottom: 5px;">Water System Leak Detection &amp; Mitigation</div>   |             |  |                 |  |           |                |     |                |        |                   |
| 4. Person authorized to sign and submit                           | <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 35%;">Name, title</td> <td style="border-bottom: 1px solid black; padding-bottom: 5px;">Charles E. Garabedian, Jr.<br/>Chairman</td> </tr> <tr> <td>Mailing address</td> <td style="border-bottom: 1px solid black; padding-bottom: 5px;">3580 S. Frank Street<br/>Fresno, CA 93725</td> </tr> <tr> <td>Telephone</td> <td style="border-bottom: 1px solid black; padding-bottom: 5px;">(559) 485-7353</td> </tr> <tr> <td>Fax</td> <td style="border-bottom: 1px solid black; padding-bottom: 5px;">(559) 485-7319</td> </tr> <tr> <td>E-mail</td> <td style="border-bottom: 1px solid black; padding-bottom: 5px;">NA</td> </tr> </table> | Name, title | Charles E. Garabedian, Jr.<br>Chairman | Mailing address | 3580 S. Frank Street<br>Fresno, CA 93725 | Telephone | (559) 485-7353 | Fax | (559) 485-7319 | E-mail | NA                |
| Name, title   | Charles E. Garabedian, Jr.<br>Chairman   |             |  |                 |  |           |                |     |                |        |                   |
| Mailing address   | 3580 S. Frank Street<br>Fresno, CA 93725   |             |  |                 |  |           |                |     |                |        |                   |
| Telephone   | (559) 485-7353   |             |  |                 |  |           |                |     |                |        |                   |
| Fax   | (559) 485-7319   |             |  |                 |  |           |                |     |                |        |                   |
| E-mail  | NA   |             |  |                 |  |           |                |     |                |        |                   |
| 5. Contact person (if different):                                 | <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 35%;">Name, title</td> <td style="border-bottom: 1px solid black; padding-bottom: 5px;">Michael Taylor</td> </tr> <tr> <td>Mailing address</td> <td style="border-bottom: 1px solid black; padding-bottom: 5px;">286 W. Cromwell<br/>Fresno, CA 93711</td> </tr> <tr> <td>Telephone</td> <td style="border-bottom: 1px solid black; padding-bottom: 5px;">(559) 449-2700</td> </tr> <tr> <td>Fax</td> <td style="border-bottom: 1px solid black; padding-bottom: 5px;">(559) 449-2715</td> </tr> <tr> <td>E-mail</td> <td style="border-bottom: 1px solid black; padding-bottom: 5px;">mtaylor@ppeng.com</td> </tr> </table>                | Name, title | Michael Taylor                         | Mailing address | 286 W. Cromwell<br>Fresno, CA 93711      | Telephone | (559) 449-2700 | Fax | (559) 449-2715 | E-mail | mtaylor@ppeng.com |
| Name, title   | Michael Taylor   |             |  |                 |  |           |                |     |                |        |                   |
| Mailing address   | 286 W. Cromwell<br>Fresno, CA 93711  |             |  |                 |  |           |                |     |                |        |                   |
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| E-mail  | mtaylor@ppeng.com  |             |  |                 |  |           |                |     |                |        |                   |
| 6. Funds requested (dollar amount):                               | <div style="border-bottom: 1px solid black; padding-bottom: 5px;">\$337,295</div>  |             |  |                 |  |           |                |     |                |        |                   |
| 7. Applicant funds pledged (dollar amount):                       | <div style="border-bottom: 1px solid black; padding-bottom: 5px;">\$0</div>  |             |  |                 |  |           |                |     |                |        |                   |
| 8. Total project costs (dollar amount):                           | <div style="border-bottom: 1px solid black; padding-bottom: 5px;">\$337,295</div>  |             |  |                 |  |           |                |     |                |        |                   |
| 9. Estimated total quantifiable project benefits (dollar amount): | <div style="border-bottom: 1px solid black; padding-bottom: 5px;">\$353,178</div>  |             |  |                 |  |           |                |     |                |        |                   |

Percentage of benefit to be accrued by applicant:	100%
Percentage of benefit to be accrued by CALFED or others:	NA (1)
10. Estimated annual amount of water to be saved (acre-feet):	320
Estimated total amount of water to be saved (acre-feet):	16,000
Over 50 years	
Estimated benefits to be realized in terms of water quality, instream flow, other:	
11. Duration of project (month/year to month/year):	7/02 to 3/03
12. State Assembly District where the project is to be conducted:	District No. 31
13. State Senate District where the project is to be conducted:	District No. 16
14. Congressional district(s) where the project is to be conducted:	District No. 21
15. County where the project is to be conducted:	Fresno
16. Date most recent Urban Water Management Plan submitted to the Department of Water Resources:	Not applicable
17. Type of applicant (select one): Prop 13 Urban Grants and Prop 13 Agricultural Feasibility Study Grants:	<input type="checkbox"/> (a) city <input type="checkbox"/> (b) county <input type="checkbox"/> (c) city and county <input type="checkbox"/> (d) joint power authority <input checked="" type="checkbox"/> (e) other political subdivision of the State, including public water district <input type="checkbox"/> (f) incorporated mutual water company
DWR WUE Projects: the above Entities (a) through (f) or:	<input type="checkbox"/> (g) investor-owned utility <input type="checkbox"/> (h) non-profit organization <input type="checkbox"/> (i) tribe <input type="checkbox"/> (j) university <input type="checkbox"/> (k) state agency <input type="checkbox"/> (l) federal agency

(1) Project developed to be locally cost effective. CALFED benefits could not be quantified.

18. Project focus:

- ☐ (a) agricultural  
☒ (b) urban

19. Project type (select one):  
 Prop 13 Urban Grant or Prop 13  
 Agricultural Feasibility Study Grant  
 Capital outlay project related to:

- ☐ (a) implementation of Urban Best  
 Management Practices  
☐ (b) implementation of Agricultural Efficient  
 Water Management Practices  
☐ (c) implementation of Quantifiable  
 Objectives (include QO number(s))  


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☒ (d) other (specify)  
 Water system audit and repairs  


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DWR WUE Project related to:

- ☐ (e) implementation of Urban Best  
 Management Practices  
☐ (f) implementation of Agricultural Efficient  
 Water Management Practices  
☐ (g) implementation of Quantifiable  
 Objectives (include QO number(s))  
☐ (h) innovative projects (initial  
 investigation of new technologies,  
 methodologies, approaches, or  
 institutional frameworks)  
☐ (i) research or pilot projects  
☐ (j) education or public information  
 programs  
☐ (k) other (specify)  


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20. Do the actions in this proposal involve  
 physical changes in land use, or  
 potential future changes in land use?

- ☐ (a) yes  
☒ (b) no

If yes, the applicant must complete the  
 CALFED PSP Land Use Checklist found at  
[http://calfed.water.ca.gov/environmental\\_docs.html](http://calfed.water.ca.gov/environmental_docs.html)  
 and submit it with the proposal.

## ***B. Signature Page***

By signing below, the official declares the following:

The truthfulness of all representations in the proposal;

The individual signing the form is authorized to submit the proposal on behalf of the applicant; and

The individual signing the form read and understood the conflict of interest and confidentiality section and waiver any and all rights to privacy and confidentiality of the proposal on behalf of the applicant.

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Signature

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Name and title

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Date

## PART TWO

### Project Summary

Malaga County Water District (MCWD) developed the proposed project to identify leaks within the distribution system and to repair and/or replace portions of the water system to reduce or eliminate water system losses. The construction project involves the construction of new water mains and repairing existing water mains to eliminate leaks in the water distribution system. The MCWD provides water and sewer services to residential, commercial and industrial entities within its boundaries.

### ***A. Relevance and Importance***

#### **1. Nature, scope and objectives**

The purpose of the project is to determine the sources of unaccounted for water in the MCWD distribution system and repair and/or replace the leaking pipelines.

The ultimate goal of this process is to minimize unaccounted for water in the MCWD distribution system by identifying leaky water mains and repairing or replacing the reaches of pipe contributing to water losses. In this process of minimizing water leaks, other goals will also be attained.

For instance, reducing water losses will result in reduced pumping. The current energy crisis in the state of California encourages minimizing energy consumption. It is estimated that 20% of the District's pumped water is unaccounted for (see Table 1 on page 8), and therefore there is an opportunity to reduce the District's pumping energy consumption by nearly that amount.

In addition, the population served by the District is primarily made up of minorities and falls under the definition of a disadvantaged community as established in the California Code of Regulations Section 63000.25. Based on the Malaga County Water District 2000 Water Supply Report (See Appendix) groundwater pumping costs and utility repairs account for approximately 20% of the District's water distribution operating expenses. Repair and/or replacement of the failing segments of the aging water system will substantially reduce pumping and repair costs for this economically disadvantaged community.

Additional benefits of the project are discussed in Section D. Benefits and Costs.



## **2. Need for Project**

Effective and efficient distribution of water is a key part of Malaga's water management plans. The District has all commercial accounts metered, all new residential units are required to have meters installed, and the District may retrofit the remaining unmetered residential units as budget allows. The District also has a system of fines in place for negligent use of water within its boundaries.

In 1999 and 2000, the MCWD pumped over 520 million gallons of water per year. Commercial and industrial users, who are the only metered users, accounted for approximately 72-73% of the total pumped volume. Based on typical water use estimates for the San Joaquin Valley, residential use accounts for only 8% of the remaining water. The remainder of approximately 105 million gallons of water (20% of total pumped) is unaccounted for. See Table 1 for a summary of pumping, water use and unaccounted for water. A recent rate analysis of the MCWD performed by Bartle Wells Associates recognized the significant amount of unaccounted for water in the District in quantities that significantly exceed the norm. A copy of the report is in the Appendix.

Possible explanations for unaccounted for water include leaking water mains, overuse by residential users, water theft, and inaccurate meters. Overuse by residential users does not appear to be a substantial contributor as the District's fine system helps to keep water overuse to a minimum. Further, the size of residential lots, amount of landscaping, and lack of water features such as swimming pools limits the potential for water wasting within the residential community. The estimates of unaccounted for water are so large that each household would have to use more than 3.5 times the typical water usage (500 gallons per day average) every day to account for the water. In addition, installation of water meters in a historically unmetered area may result in a maximum of 25% reduction in water use. Twenty-five percent of the estimated residential water use is equivalent to less than 10% of the unaccounted for water. Water theft and inaccurate meters are both possible contributors to the problem, but are not expected to account for the magnitude of water lost from the system. This leaves water system leaks as the most likely and substantial source of unaccounted for water. Significant portions of the MCWD water distribution system facilities were constructed approximately forty years ago. This existing infrastructure is near or past its useful life. Materials utilized for the water mains are susceptible to corrosion, abrasion and leaks.

Water management is a critical issue throughout the San Joaquin Valley. For the MCWD, which depends entirely upon groundwater to meet its water needs, the ability to protect the quantity and quality of its groundwater supply is critical to its customers.

Table 1

DATE	PUMP TOTALS	COMMERCIAL WATER USE		UNMETERED WATER		ESTIMATED RESIDENTIAL USE		UNACCOUNTED FOR WATER	
	Gallons	Cubic feet	Gallons	Gallons	%	Services	Gallons	Gallons	%
Jan-99	29,286,700	3,044,563	22,773,331	6,513,369	22%	215	2,400,000	4,113,369	14%
Feb-99	26,118,500	2,704,372	20,228,703	5,889,797	23%	215	2,100,000	3,789,797	15%
Mar-99	37,000,800	3,806,610	28,473,443	8,527,357	23%	215	3,000,000	5,527,357	15%
Apr-99 *	37,000,000	3,451,615	25,818,080	11,181,920	30%	215	2,700,000	8,481,920	23%
May-99 *	47,000,000	4,370,545	32,691,677	14,308,323	30%	215	3,400,000	10,908,323	23%
Jun-99 *	64,000,000	5,795,119	43,347,490	20,652,510	32%	215	4,500,000	16,152,510	25%
Jul-99 *	54,000,000	5,022,132	37,565,547	16,434,453	30%	215	3,900,000	12,534,453	23%
Aug-99 *	57,000,000	5,656,510	42,310,695	14,689,305	26%	215	4,400,000	10,289,305	18%
Sep-99	46,935,400	4,312,307	32,256,056	14,679,344	31%	215	3,400,000	11,279,344	24%
Oct-99	49,272,700	4,779,506	35,750,705	13,521,995	27%	215	3,700,000	9,821,995	20%
Nov-99	38,370,000	4,236,210	31,686,851	6,683,149	17%	215	3,300,000	3,383,149	9%
Dec-99	35,379,300	3,163,930	23,666,196	11,713,104	33%	215	2,500,000	9,213,104	26%
<b>TOTALS</b>	<b>521,363,400</b>	<b>50,343,419</b>	<b>376,568,774</b>	<b>144,794,626</b>			<b>39,300,000</b>	<b>105,494,626</b>	<b>20%</b>
Jan-00 *	40,000,000	3,885,499	29,063,533	10,936,467		222	3,100,000	7,836,467	20%
Feb-00	28,710,200	2,878,905	21,534,209	7,175,991	25%	222	2,300,000	4,875,991	17%
Mar-00	32,665,900	3,266,442	24,432,986	8,232,914	25%	222	2,600,000	5,632,914	17%
Apr-00	39,818,100	3,864,260	28,904,665	10,913,435	27%	222	3,100,000	7,813,435	20%
May-00	48,474,300	4,490,159	33,586,389	14,887,911	31%	222	3,600,000	11,287,911	23%
Jun-00	61,399,500	5,519,681	41,287,214	20,112,286	33%	222	4,400,000	15,712,286	26%
Jul-00	64,425,800	5,932,031	44,371,592	20,054,208	31%	222	4,800,000	15,254,208	24%
Aug-00	69,482,900	6,801,973	50,878,758	18,604,142	27%	222	5,500,000	13,104,142	19%
Sep-00	52,614,000	5,019,194	37,543,571	15,070,429	29%	222	4,000,000	11,070,429	21%
Oct-00 *	45,000,000	4,619,178	34,551,451	10,448,549	23%	222	3,700,000	6,748,549	15%
Nov-00 *	25,900,000	2,369,679	17,725,199	8,174,801	32%	222	1,900,000	6,274,801	24%
Dec-00	34,737,000	3,214,652	24,045,597	10,691,403	31%	222	2,600,000	8,091,403	23%
<b>TOTALS</b>	<b>543,227,700</b>	<b>51,861,653</b>	<b>387,925,164</b>	<b>155,302,536</b>			<b>41,600,000</b>	<b>113,702,536</b>	<b>21%</b>
Jan-01	32,230,000	3,360,704	25,138,066	7,091,934	22%	222	2,700,000	4,391,934	14%
Feb-01	28,270,000	2,774,897	20,756,230	7,513,770	27%	222	2,200,000	5,313,770	19%
Mar-01 **	36,200,000	3,554,465	26,587,398	9,612,602	27%	222	2,900,000	6,712,602	19%
Apr-01	29,602,000	2,946,710	22,041,391	7,560,609	26%	222	2,400,000	5,160,609	17%
May-01	58,795,000	5,957,943	44,565,414	14,229,586	24%	222	4,800,000	9,429,586	16%
Jun-01	63,627,000	6,038,909	45,171,039	18,455,961	29%	222	4,800,000	13,655,961	21%
Jul-01	65,311,000	6,432,843	48,117,666	17,193,334	26%	222	5,200,000	11,993,334	18%
Aug-01	65,091,000	6,375,003	47,685,022	17,405,978	27%	222	5,100,000	12,305,978	19%
Sep-01	58,983,000	5,309,278	39,713,399	19,269,601	33%	222	4,300,000	14,969,601	25%
Oct-01 *	53,000,000	5,197,706	38,878,841	14,121,159	27%	222	4,200,000	9,921,159	19%
Nov-01 *	21,500,000	2,158,746	16,147,420	5,352,580	25%	222	1,700,000	3,652,580	17%
Dec-01	26,749,000	2,689,908	20,120,512	6,628,488	25%	222	2,200,000	4,428,488	17%
<b>TOTALS</b>	<b>539,358,000</b>	<b>52,797,112</b>	<b>394,922,398</b>	<b>144,435,602</b>			<b>42,500,000</b>	<b>101,935,602</b>	<b>19%</b>

## ***B. Technical/Scientific Merit, Feasibility, Monitoring & Assessment***

### **1. Methods, procedures and facilities**

The Malaga County Water District (MCWD) is located in an area with highly pervious soils, where leaking water percolates deep into the ground, therefore leakage is not evident at the surface and difficult to diagnose visually. In the last three years, as documented in Table 1, the MCWD has lost on average approximately 20% of its pumped water through the distribution system; however, potential leaks are not visible, thus the need for the project.

#### **Overview of Survey Process**

The MCWD will consult American Leak Detection to locate the water system leaks. Initially the system will be surveyed for sonic indications of leaks with a survey tool, and segments with indications of leaks are identified for return to pinpoint the leak location. The leak survey begins at one end of the system, or portion of system, and proceeds section by section until completed. The sensors are placed at intervals determined in part by the pipe size, material, ambient noise level, pressure, as well as availability of access. Generally, the setup length desired on a water distribution system is one city block.

#### **Methods & Equipment**

The leak detection service is performed using two primary pieces of equipment. First, the leak survey is performed to identify segments of pipeline with a leak. This is carried out by the use of a highly sensitive sonic meter for determining leak sound levels on hydrants, and valves. Attachments such as a ground microphone for confirmation of pinpointed leaks may be used.

Pinpointing of leaks is performed with either a proprietary ground vibration sensor, or with a Correlator. The Correlator is a device that includes two very sensitive preamplifier microphone / radio transmitters and a central microprocessor to correlate the location of the leak detection received. It is effective on all kinds of pipe, including the District's non-metallic and large diameter. Other types of equipment available for use to assist the survey process include electronic line location tools, pin and box locators, and a proprietary filtered ground microphone.

#### **Results**

The results of the leak detection survey include a precise computerized pictorial record of each located leak, which includes dimensions from known system points and geographic locations. Records of all setups, measurements and leak locations are kept in a Correlation Survey Log that is provided as a part of their service. Also included will be notes from their daily survey activities and a Leak Summary itemizing all leaks located during their survey.

## **2. Task List and Schedule**

The work plan for the proposed Urban Water Conservation Program details the scope of work needed to identify water leak locations and provide construction documents and supervision.

The goals of this project are to investigate the condition of the water distribution system, identify failing water mains, evaluate construction alternatives and then implement the most cost effective alternatives. These will be accomplished through the following tasks:

- Task 1. Review existing information. Acquire and utilize as-built drawings, record maps, low-pressure complaints, and pipeline repair records from District records.
- Task 2. Classify all pipelines by age and pipe material to prioritize the leak detection investigation.
- Task 3. Perform leak detection survey.
- Task 4. Evaluate alternatives for repair of all water mains identified in leak detection survey.
- Task 5. Prepare conceptual design of pipeline repairs and replacements.
- Task 6. Prepare quantity take-off and estimate of probable construction costs based on conceptual design plans.
- Task 7. Determine project impacts on the local community and existing public and private infrastructure.
- Task 8. Determine which permits and approvals are needed for the project and probable requirements/conditions to secure such authorizations.
- Task 9. Prepare final design plans and specifications
- Task 10. Advertise for bids
- Task 11. Award project
- Task 12. Pipeline repairs

In the unlikely event that the leak detection survey determines the water system losses are not due to leaking water mains or components, and it is determined that the project is not feasible, the District will opt to cease work on the project. Cessation in work would require consultation and approval with DWR and the District Board of Directors.

The work plan tasks are provided with additional detail below:

**Task 1. Review existing information. Acquire and utilize as-built drawings, record maps, low-pressure complaints, and pipeline repair records from District records.**

Existing as-built drawings and pipeline repair records will be gathered and reviewed by the project team. Year of installation, size of pipe, type of pipeline material and repair type and locations will be gathered for input into the District's existing GIS model.

**Task 2. Classify all pipelines by age and pipe material to prioritize the leak detection investigation.**

The data gathered in Task 1 will be input into the District's GIS model. With this model, we can then summarize and prioritize the water system pipelines for likelihood of leaks. The oldest pipelines comprised of materials other than PVC will be the first priority for investigation for leaks. Pipeline sections requiring frequent repairs indicate an increased potential for water losses. Areas of low water pressure may also indicate water losses. The network analysis model of the water system will be updated and reviewed with respect to actual water system deliveries and pressures. The number and size of water services will be verified. The location of existing valves will also be verified with respect to adequacy for isolation of pipeline segments during the investigation and during rehabilitation or replacement activities.

**Task 3. Perform leak detection survey.**

The American Leak Detection Company out of Palm Springs, California will perform the leak detection investigation. Through the use nondestructive methods such as electronic ground contact microphones and sound acoustical time delay equipment (Correlator), they will survey the Malaga County Water District water system for leaks.

Upon completion of the investigation, American Leak Detection will provide a report containing a summary of the lines surveyed, the condition of the pipelines, areas of concern, and recommendations for repair of the leaking pipelines. Locations where leaks are detected will be marked in the field so that they can be surveyed for preparation of construction plans.

**Task 4. Evaluate alternatives for repair of all water mains identified in leak detection survey.**

The results of the leak detection survey will be evaluated to verify the locations of water leaks in the MCWD distribution system. The results of the

leak detection investigation will include a summary of the condition of the pipelines and particular areas of concern.

Depending on the material type and age of the pipelines needing repair, various construction alternates will be evaluated for cost effectiveness. These alternatives may include new pipelines (conventional), pipe bursting, sliplining, and other new developments. The advantages and disadvantages of the various alternatives will be reviewed on a site-specific basis.

**Task 5. Preliminary design of pipeline repairs and replacements.**

A conceptual design that includes preliminary plans and detail drawings of each of the areas requiring water main repair or replacement will be prepared. Sufficient detail will be included to determine the need for permits, limits of trench resurfacing, and disturbance to existing improvements so that the costs can be accounted for in the preliminary estimate. This task will summarize the available alternatives and determine the recommended alternative based on the various impacts defined in other tasks.

**Task 6. Prepare quantity take-off and estimate of probable construction costs.**

Construction costs will be estimated at 2002 prices using prevailing wage scales; estimated construction costs will be shown on a bid schedule. Critical order of work or health issues that may influence construction activities will be identified.

Items of work for construction will be broken down into mobilization, including insurance and bonds, water pipe replacement by size, trench resurfacing and removal and replacement of existing improvements.

Other costs will include design, engineering and administration.

**Task 7. Determine project impacts on the local community and existing public and private infrastructure.**

In the process of conceptual design, the impacts to existing infrastructure will be evaluated, including review for potential conflicts and relocation requirements.

It is anticipated that the only negative impacts to the local community will be limited to the temporary inconveniences associated with construction such as lane closures and limited water service shut downs. The extents of these inconveniences will be determined during the conceptual design process. Public meetings will be held to gain public input and determine additional impacts to those served by the District.

**Task 8. Determine which permits and approvals are needed for the project and probable requirements/conditions to secure such authorizations.**

The requirements needed for obtaining permits and approvals such as encroachment permits from the County of Fresno, railroads, and Caltrans will be determined.

**Task 9. Prepare final design plans and specifications**

Based upon the evaluation of pipe repair alternates final plans and specifications will be prepared for construction of the pipeline leak repairs identified by the leak detection survey.

**Task 10. Advertise for bids**

Bids will be solicited by publishing the notice to contractors in the local newspaper. A period of thirty (30) days will be given for the contractors to acquire plans and prepare their bid proposals.

**Task 11. Award project**

Bids will be received by the MCWD for the proposed pipeline repairs. The MCWD Board of Directors meets on the second and fourth Tuesdays of every month, at which time they will award the construction contract to the lowest qualified bidder.

**Task 12. Pipeline Repairs**

Contractor will perform the pipeline repairs per the construction documents. Provost and Pritchard Engineering Group, Inc. will perform the required construction observation services on behalf of the MCWD.

The following page is a schedule for performance of the tasks listed above.





### **3. Monitoring and Assessment**

All wells in the MCWD water distribution system are metered, with daily and monthly total flows logged for monitoring. With the exception of the older residential neighborhoods, which account for less than 200 services, all District customers are metered. With reasonable estimates of water use for the unmetered residential customers, it is apparent that a large quantity of water is being lost from the system.

The MCWD will continue to meter all well production and water deliveries to the majority of their customers. Upon completion of the water system repairs, the data logged from the meters will be evaluated on a monthly basis and summarized on a yearly basis to evaluate the effectiveness of the project. Recent years have shown water pumped and unaccounted for in excess of 100 million gallons per year. The evaluation of future metering data will utilize the recent past as a benchmark for performance.

The pumping costs sustained by the MCWD will also be compared to past data as a secondary check on the performance of the project. Pumping costs would be expected to drop proportional to the water savings as a result of the project. The Tables on the following pages will be used for monitoring and assessment.

### **4. Preliminary Plans and Specifications and Certification Statement**

Not required for water system audit.

Monitoring and Assessment Table 1

DATE	PUMP TOTALS	COMMERCIAL WATER USE		UNMETERED WATER		ESTIMATED RESIDENTIAL USE		UNACCOUNTED FOR WATER	
	Gallons	Cubic feet	Gallons	Gallons	%	Services	Gallons	Gallons	%
Jan-01	32,230,000	3,360,704	25,138,066	7,091,934	22%	222	2,700,000	4,391,934	14%
Feb-01	28,270,000	2,774,897	20,756,230	7,513,770	27%	222	2,200,000	5,313,770	19%
Mar-01	36,200,000	3,554,465	26,587,398	9,612,602	27%	222	2,900,000	6,712,602	19%
Apr-01	29,602,000	2,946,710	22,041,391	7,560,609	26%	222	2,400,000	5,160,609	17%
May-01	58,795,000	5,957,943	44,565,414	14,229,586	24%	222	4,800,000	9,429,586	16%
Jun-01	63,627,000	6,038,909	45,171,039	18,455,961	29%	222	4,800,000	13,655,961	21%
Jul-01	65,311,000	6,432,843	48,117,666	17,193,334	26%	222	5,200,000	11,993,334	18%
Aug-01	65,091,000	6,375,003	47,685,022	17,405,978	27%	222	5,100,000	12,305,978	19%
Sep-01	58,983,000	5,309,278	39,713,399	19,269,601	33%	222	4,300,000	14,969,601	25%
Oct-01	53,000,000	5,197,706	38,878,841	14,121,159	27%	222	4,200,000	9,921,159	19%
Nov-01	21,500,000	2,158,746	16,147,420	5,352,580	25%	222	1,700,000	3,652,580	17%
Dec-01	26,749,000	2,689,908	20,120,512	6,628,488	25%	222	2,200,000	4,428,488	17%
Totals	539,358,000	52,797,112	394,922,398	144,435,602	3		42,500,000	101,935,602	19%
Jan-02									
Feb-02									
Mar-02									
Apr-02									
May-02									
Jun-02									
Jul-02									
Aug-02									
Sep-02									
Oct-02									
Nov-02									
Dec-02									
Totals									
Jan-03									
Feb-03									
Mar-03									
Apr-03									
May-03									
Jun-03									
Jul-03									
Aug-03									
Sep-03									
Oct-03									
Nov-03									
Dec-03									
Totals									

**Monitoring and Assessment Table 2**

DATE	WELL NO. 1		WELL NO. 4		WELL NO. 6		TOTAL	
	<i>kw/hr</i>	<i>Cost</i>	<i>kw/hr</i>	<i>Cost</i>	<i>kw/hr</i>	<i>Cost</i>	<i>kw/hr</i>	<i>Cost</i>
Jan-01								
Feb-01								
Mar-01								
Apr-01								
May-01								
Jun-01								
Jul-01								
Aug-01								
Sep-01								
Oct-01								
Nov-01								
Dec-01								
Totals								
Jan-02								
Feb-02								
Mar-02								
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Nov-02								
Dec-02								
Totals								
Jan-03								
Feb-03								
Mar-03								
Apr-03								
May-03								
Jun-03								
Jul-03								
Aug-03								
Sep-03								
Oct-03								
Nov-03								
Dec-03								
Totals								

### ***C. Qualifications of the Applicants and Cooperators***

The experience and qualifications of the Malaga County Water District (MCWD) engineering staff and cooperators are demonstrated in the resumes on the following pages. Provost & Pritchard Engineering Group, Inc. is the Engineer for MCWD and will provide project management and engineering services for the proposed project.

Provost & Pritchard Engineering Group, Inc. began establishing a tradition of engineering excellence in Central California in 1968. Today, the company offers more registered engineers and local staff than any other engineering office in the San Joaquin Valley. Accordingly, we have developed expertise in a diversity of technical services.

The following is a summary of the project team and resumes are located in the Appendix.

#### **Project Manager**

Michael Taylor, PE is a Principal Engineer with Provost and Pritchard Engineering Group, Inc., and he is the District Engineer for the Malaga County Water District.

#### **Project Engineer**

Daniel Bond, PE is an Associate Engineer with Provost & Pritchard Engineering Group, Inc., and he currently provides support for Malaga County Water District operations.

#### **Leak Detection**

American Leak Detection has been the recognized world leader in the detection of concealed leaks since 1974. They will provide leak detection services to determine the extent and locations of water main leaks to facilitate design pipeline repairs and replacements to eliminate water system leaks.

## D. Benefits and Costs

There are many benefits to be realized and information to be gained by the proposed leak detection survey and subsequent capital outlay project. First and foremost, the project may eliminate significant water losses from the MCWD distribution system consistent with water management goals of the District and the Department of Water Resources. Additional benefits include a decrease of the potential for water quality issues that may result from low pressure or intrusion to the water system through the leaking facilities.

The capital costs associated with this project are summarized in the following table:

**Table 2 - Capital Costs**

Task	Capital Cost Category	Cost	Contingency Costs		Subtotal
			Percent	Dollars	
a	Land Purchase/Easement	\$0	15%	\$ 0	\$ 0
b	Planning/Designing/Engineering	\$34,950	15%	5,243	40,193
c	Materials/Installation	\$240,000	15%	36,000	276,000
d	Surveying (Leak detection)	\$13,550	15%	2,033	15,583
e	Structures	\$0	15%	0	0
f	Equipment Purchases/Rentals	\$0	15%	0	0
g	Environmental Mitigation/ Enhancement	\$0	15%	0	0
h	Construction Administration/ Overhead	\$4,800	15%	720	5,520
i	Project Legal/ License Fees	\$0	15%	0	0
j	Other	\$0	15%	0	0
	Total				\$ 337,295

The capital costs in Table 2 are broken down to manpower and direct expenses in Attachment A. Table 3, located on the following page, is an estimate of project costs and the staffing plan. Annual operations and maintenance costs are summarized in the following Table 4.

**Table 4 - Annual Operations and Maintenance Costs**

<div> <div>(1) Cost of Water</div> <div>\$ 70</div> <div>per AF</div> </div> <div> <div>(2)Cost of Pumping</div> <div>\$ 42</div> <div>per AF</div> </div>				
Annual Administration	Annual Operations	Annual Maintenance	Annual Other (chemicals)	Total Annual O&M Costs
Not Included	\$67,714	\$24,901	\$19,581	\$112,196



Based upon the pumping records shown in Table 1 for the past three years, the Malaga CWD pumps approximately 520 million gallons of water per year, which equates to 1596 acre-feet of water annually. The cost of water (1) shown in Table 3 is based upon the District's expenses directly related to delivery of the water (pumping, maintenance and chemicals) summarized as the Total Annual O&M Costs, divided by the quantity of water pumped per year. Administration costs were neglected because a decrease in water system losses will not result in a decrease in administration costs. The cost of pumping (2) shown in Table 3 is based upon the District's expenses for power to operate the pumps for the year, summarized as Annual Operations, divided by the quantity of water pumped per year. The figures shown in Table 3 were obtained from the Malaga CWD Combined Statement of Revenues, Expenses, and Changes in Retained Earnings for the year ended June 30, 2001. A copy is provided in the Appendix.

Table 5 represents the annual benefit projected for the project based on elimination of the system water leaks.

<b>Table 5 - Water Supply Benefits.</b>			
Supply Sources	Cost of Water (\$/AF)	Annual Displaced Supply (AF)	Annual Avoided Costs (\$)
Pumped water	\$70	320	\$22,495

The Malaga CWD water system losses averaged approximately 20% of their pumping over each of the last three years. The Annual Displaced Supply of 320 acre-feet represents 20% of the 1596 acre-feet pumped by the District annually. The Annual Avoided Costs is equal to the cost of water multiplied by the acre-feet of water to be conserved by this project.

Table 6 represents the present value of the water supply benefit realized based upon 50-years and a 6% discount rate.

<b>Table 6 - Total Water Supply Benefits</b>		
a	Annual Avoided Costs of Current Supply Sources (\$)	\$22,495
b	Discounted Water Supply Benefits (\$)	\$353,178

Table 7 summarizes the benefit /cost ration analysis for the project.

<b>Table 7 - Benefit/Cost Ratio</b>		
a	Total Discounted Water Supply Benefits (\$)	\$353,178
b	Total Discounted Project Costs (\$)	\$337,295
c	Benefit/ Cost Ratio	1.05

The proposed project cost is represented in line item a. The present value of the project is represented in line item b. Therefore, the project has a benefit/cost ratio of 1.05.

As a result of reduced or eliminated water losses, energy use and pumping costs will be greatly reduced in this economically challenged location. Water previously lost will then be available to expand economic development without additional water supply sources. In addition, portions of the water system may benefit from more consistent and higher water system pressure.

The leak detection survey will result in recommendations regarding capital expenditures to the existing water distribution system based on specific examination of the existing facilities. In addition to the many benefits, there is valuable information to be gained by the survey. As a result of the review and compilation of water system data, effective distribution system information will be available in Arcview (GIS) for the County, State and EPA. This information will be useful to the MCWD and the Department of Health Services for improved service to the existing and future customers of the District.



### ***E. Outreach, Community Involvement and Acceptance***

The population served by the District is primarily made up of minorities and falls under the definition of a disadvantaged community as established in the California Code of Regulations Section 63000.25. As previously mentioned, it is estimated that 20% of the District's pumped water is unaccounted for due to leaking pipelines. Repair and replacement of the failing segments of the aging water system will substantially reduce pumping and repair costs for this economically disadvantaged community.

APPENDIX
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## ***Resumes***

## Michael Taylor, PE

Mr. Taylor is a principal engineer for Provost & Pritchard. He supervises all projects related to water treatment and distribution, wastewater treatment and disposal/reclamation, storm drainage and groundwater planning. He serves as principal-in-charge for all transportation and private development work. He has participated in several water conservation projects for agricultural and municipal areas and has served as project manager on projects funded by various agencies including EDA, RUS, DWR, Department of Corrections, State Water Resources Control Board (Small Community Grant), and HUD (CDBG).

Mr. Taylor presently serves as District Engineer for Caruthers and Armona Community Services Districts and Malaga County Water District.

### EXPERIENCE

?? **Malaga County Water District** - Presently serves as District Engineer. Project Manager for evaluation of alternatives, design and construction management for a new water supply well, water and sewer line extensions and expansion of the wastewater treatment and disposal facilities to a capacity of 1.2 mgd.

?? **Armona Community Services District** - Presently serves as District Engineer. Also served as project manager for expansion of existing wastewater treatment plant and disposal/reclamation facilities to a capacity of 0.4 MGD. Project Manager for funding administration, design and construction review for \$2.5M water treatment, storage and distribution system project.

?? **County of Tulare** - Project Manager for design and construction review of a water supply well, storage tank and distribution system for county jail facilities at Sequoia Field.

?? **Allensworth Community Services District** – Principal-in-Charge for water system rehabilitation project that included a new well, distribution system, hydro-pneumatic tank and appurtenances.

?? **City of Huron, CA** - Project Manager. Preparation of plans, specifications and operation and maintenance manual for the design of water treatment facilities, water transmission pipeline and water storage facilities. The project involved incorporating new improvements with existing treatment and storage facilities.

B.S. Civil Engineering, University of California, Davis, 1980  
 M.S. Civil Engineering, California State University, Fresno, 1984  
 Civil Engineer, California, #39961  
 Civil Engineer, Oregon, #18039  
 CWEA, WEF, ASCE, WaterReuse

## Daniel Bond, PE

Mr. Bond has a wide variety of experiences in design and surveying on municipal, transportation, private development, and irrigation projects. He has served as engineer for water supply, grading and drainage, storm drain, roadway, bridge approach, utility relocation and booster station projects. In addition, Mr. Bond has construction management experience and inspection experience on water supply and road reconstruction projects.

### EXPERIENCE

- ? ? ***Water Main Replacement, Mariposa, CA*** - Assistant engineer responsible for design of water mains to replace existing deteriorated water distribution lines for the community of Mariposa. Design considerations included planning for construction sequencing to minimize inconvenience to water users.
- ? ? ***Water Tank and Transmission Main, Mariposa, CA*** - Assistant engineer responsible for design and construction inspection of a water storage tank and distribution pipeline to increase storage capacity for the community of Mariposa.
- ? ? ***Water Treatment, Storage and Distribution Facilities, Armona, CA***- Assistant engineer responsible for preparation of construction plans, acquisition of encroachment permits and utility research. Also assisted in layout of water treatment, storage facility sites, and water mains.
- ? ? ***Marks and Shaw Avenues Railroad Undercrossings, Fresno, CA*** – Engineer responsible for design of relocated water, sewer, and storm drain mains to facilitate construction of railroad bridges with below grade roadway crossings. The projects included relocation of 8 and 12" water mains, 10" and 24" sewer mains, and 30" storm drain piping. With all utilities in the corridor requiring relocation, considerable coordination efforts were required with the prime consultant, the City of Fresno, PG&E, Pacific Bell and Media One.
- ? ? ***Water Storage Tank, Lindsay, CA*** – Engineer responsible for design of a 4 million gallon welded water storage tank to replace an aging 1 million gallon tank in the foothills of Lindsay. Many design alternates required evaluation due to the limited site area and rock subgrade. Alternates were evaluated to minimize rock excavation, add to system pressures and minimize downtime for demolition of the existing tank.

B.S. - Civil Engineering - California State University, Fresno

Civil Engineer, California #57133

## ALD SERVICES

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American Leak Detection has been the recognized world leader in the detection of concealed leaks since 1974. Whether a leak is in your pool, spa, sewer, well or other concealed plumbing system, we offer you a prompt, reliable, accurate and economical solution.

It takes a blending of expert technicians and quality equipment to end the damage and costs associated with hidden leaks. Our extensive training programs, state-of-the-art equipment and commitment to customer service have saved our customers millions of dollars and billions of gallons of water.

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## MUNICIPAL SERVICES

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Services listed vary between territories. contact your [local American Leak Detection](#) office for services offered in your local area.

ALD provides complete leak surveys on water distribution systems using state-of-the-art equipment including advanced correlation technology. We also provide quick response to local emergencies such as main line breaks.

### Call ALD

- ?? Before property damage occurs
  - ?? To Reduce operating expenses and unaccounted for water
  - ?? For professional reports
  - ?? To eliminate dry holes
  - ?? To decrease liability for catastrophic breaks
- 

***The mission of American Leak Detection is to find leaks in a manner that is non-invasive, efficient and environmentally sound. We will give prompt, professional and courteous service to all customers, while providing the best leak detection services in the world.***

***Bartle Wells Associates***  
***Water and Wastewater Financial Plan and Rate Review***

## ***2000 Water Supply Report***



***Combined Statement of Revenues, Expenses and Changes in Retained Earnings***



**MALAGA COUNTY WATER DISTRICT**  
**Proposition 13 -- Consolidated Water Use Efficiency 2002**  
Proposed Project Task Schedule

Week Beginning (Monday start)		July 2002					Aug 2002				Sep 2002					Oct 2002				Nov 2002				Dec 2002					Jan 2003				Feb 2003				Mar 2003							
		1	8	15	22	29	5	12	19	26	2	9	16	23	30	7	14	21	28	4	11	18	25	2	9	16	23	30	6	13	20	27	3	10	17	24	3	10	17	24	31			
Task 1	Review existing information																																											
Task 2	Pipeline classification & Prioritization																																											
Task 3	Leak detection investigation & report																																											
Task 4	Evaluate pipeline repair alternatives																																											
Task 5	Conceptual Design																																											
Task 6	Cost Estimate																																											
Task 7	Project Impacts																																											
Task 8	Permits																																											
Task 9	Prepare Final Plans & Specifications																																											
Task 10	Advertise for Bids																																											
Task 11	Award Project																																											
Task 12	Water system repairs																																											